

**MEG ST  
2/4 MEG  
RAM CARD  
FOR ATARI  
520/1040  
STF/M**

**USES 1 MEG RAM CHIPS  
(RAM NOT INCLUDED)**

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**MEGSTF INSTALLATION**

**CAUTION:** This product should only be installed by persons with proper training in the art of soldering. Newell Industries will not be held responsible for damage to the computer due to neglect or carelessness. Read these instructions completely before preceding.

**THINGS TO KNOW**

The ST computer has a memory management unit (MMU), part number CO25912 that controls access to the dram memory. It supports 10 address lines (A0-A9) that will address up to 4 megabytes using two banks, numbered 0 & 1. Each bank has a row address strobe (RAS) and two column address strobes (CAS). The RAS line of each bank is connected to 16 256K drams, and the two CAS lines are connected to 8 each of these these dram. 256K dram require 9 address lines and A0-A8 from the MMU are used. Each dram is one bit. Each byte is 8 bits, thus each 16 dram row is 512K bytes. One meg drams (1024K) require 10 address lines (A0-A9). This is the only electrical difference, but they have 18 pins and are not pin compatible with the 16 pin 256K drams. The reason for this upgrade board.

The MMU pin numbers for bank 0 are RAS0=8, CAS0L=7, and CAS0H=6. The MMU pin numbers for bank 1 are RAS1=18, CAS1L=21, and CAS1H=22. The MMU pin number for the A9 address line is pin 64.

**INSTALLATION (1040 MOTHERBOARD)**

1. Disassemble computer and remove the motherboard.
2. Locate and remove the 256K ram chips and their capacitors. If you ordered the assembled board you can cut these components out with a pair of diagonal pliers. If you ordered the bare board, desolder the capacitors and install them on our board and assemble the board. This will save you a few bucks.
3. Solder or socket the cable connector in one of the 1st old ram locations in the first or second row of where the 256K rams were. Position the upgrade board (component side up) on top of the motherboard and determine if you want to plug into the 1st or second row to get the best fit for your motherboard (they are not all the same). The cable is designed to be folded so it would work with different revisions of motherboards.
4. Connect CAS0H to the CASxH resistor common with pin 15 of the 9th -16th ram chip location in the row you plugged the cable into.
5. Connect RAS1 to ram locations pin 4 of the opposite row. Connect CAS1L to the CASxL resistor common to pin 15 of the 1st-8th ram chip location of this row. Connect CAS1H to the CASxH resistor common to pin 15 of the 9th-16th ram chip location in this row.
6. If you are leaving one bank of 256K ram in the computer, you can use either (0 or 1) of our banks to access the additional ram. Just be sure you get the right CAS's and RAS's hooked up for your configuration. The resistors on the rev.A motherboard are CAS0H-R90, CAS0L-R91, CAS1H-R93, CAS1L-R94.
7. The D0 data line is connected through the cable, connect the other 15 data lines (D1-D15 on the bottom of the board), one to each ram chip location pin 2 or 14 of ONE row. Make these connections with reasonably short wires.
8. Connect A9 to pin 64 of the MMU socket on the bottom of the motherboard (U15, Rev.A).
9. Install one or two rows of 1 meg x 1 bit dram (100 NS) on the upgrade board. Make sure the board pins are not shorting to anything, reassemble and test computer. With the additional ram installed, it takes a few seconds longer for the ram to clear when you turn the computer on.

**NOTES :**

1. The ram chips can be removed quickly and saved by using a commercial grade heat gun. Set the heat gun pointing up and block the air input so there is minimal airflow out of the gun. Hold the ram location of the motherboard over the heat gun (component side up, away from the heat) with one hand and gently pry the ram chip out with a suitable tool as the solder melts. This method is a little tricky. You need to remove the ram chip as soon as possible and be careful not to damage the board. Also, if you want to save your caps, desolder and remove them first or you are sure to break some of them. It will also depend on how hot your gun gets as to how close to hold the motherboard to it. The first chip takes a while before the solder will melt. After that, the others will come out pretty quick because of the board heating up. This method is very fast and if you are careful very clean. Do this at your own risk.
2. I know of some people that leave the ram chips in, and just cut the power leads to them. They say it works, and probably will, but it leaves less room for the upgrade to fit in the computer.
3. On the 520STFM model, resistors for CAS1L and CAS1H will probably not be installed. Install them if they aren't. (68ohm, 1/4watt). The RAS lines do not have any resistors.

4. If you are upgrading to 2.5 meg, leave one bank of 256K chips in. Position upgrade board on top of mother board to determine which bank to leave in.

### ORIGINAL 520ST INSTALLATION

Installation is basically the same, except you will only have one row to plug the board in. Also, some of the earlier 520 motherboards did not have the resistor pads for the CAS lines and the traces were cut and the resistors were soldered to the ram chips. Make sure that each CAS line that you hook up goes through a 68 ohm resistor.

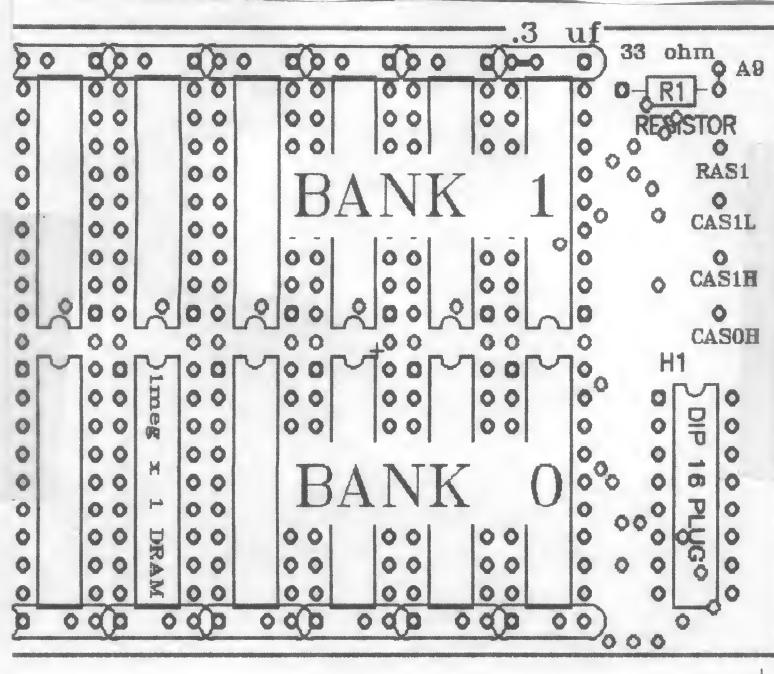
You will have to connect RAS1, CAS1L, and CAS1H to the MMU pins. On the rev. N motherboard, R133 is the CAS0H resistor and R134 is the CAS0L resistor.

### WARRANTY

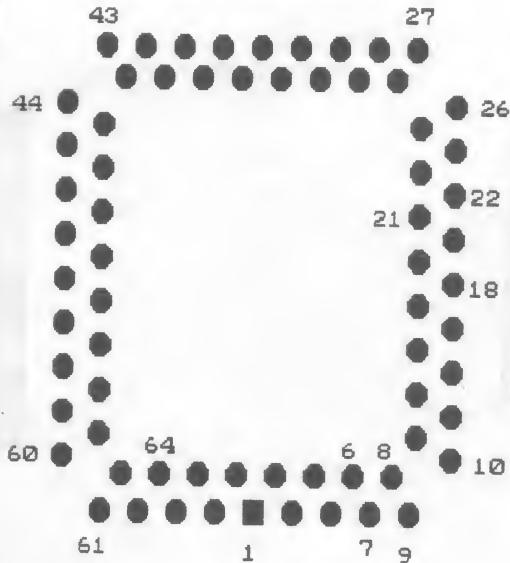
Newell Industries will repair or replace any defective part for a period of ninety days from date of purchase at no charge. This excludes parts that have been mishandled or modified in any way.

### GENERAL INFORMATION

This is a very simple product and there isn't much that can be wrong with it. If you have any problems, double check your installation and you will probably find it. If you need help, give us a call and we will be happy to help in any way we can. Collect calls can not be accepted.



MMU SOCKET



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